

REMARKS

Applicants submit an affidavit that distinguishes the present invention from US 4,951,852 to Rancoulle.

103(a) Rejection: Rancoulle

The Examiner requested a statement of ownership in the invention pursuant to possible 102(e), (f) or (g) prior art under 103(a). At the time of the invention, the inventors were employees of a subsidiary of Vesuvius Crucible Company and were obligated to assign the entirety of the invention to Vesuvius Crucible Company, which remains the sole owner of the application.

A. The Examiner has rejected claims 10-17 and 19-20 as obvious in light of US 4,951,852 to Rancoulle. Rancoulle teaches a pouring shroud with an insulating coating that may be applied to the inner and outer surface of the shroud. The coating adds a measure of thermal shock resistance to the shroud, thereby reducing the chance of cracking when the shroud is exposed to liquid metal at the beginning of a casting cycle. The Examiner notes that Rancoulle teaches a coating prepared from a slurry comprising (a) a fused silica grain, (b) ceramic fibers, (c) glass-forming frits, and (d) water. The Examiner argues that, when exposed to liquid metal, the Rancoulle coating would produce a gas impermeable layer.

Applicants disagree. Rancoulle does not teach (1) a gas-impermeable layer, (2) suggest the formation of gas-impermeable layer, or even (3) describe the possible advantage of a gas-impermeable layer. The Examiner has cited nothing in Rancoulle or any other reference to suggest that the formation of a gas-impermeable layer inherently occurs on contact with liquid metal. Further, Applicants submit an affidavit from Eric Hanse that explicitly denies the formation of a gas-impermeable layer from the Rancoulle coating.

Hause is a co-worker of Rancouille and is very familiar with the Rancouille coating. The Rancouille coating functions well as an insulating coating but, upon contact with liquid metal, the coating rapidly erodes from the surface of the pouring shroud. Apparently, the silica/ceramic fiber matrix cannot withstand tons of liquid metal passing through a pouring shroud. Also, the minor amount of glass-forming frits in the Rancouille coating would not form a continuous glass phase which, presumably, the Examiner believes would form the gas impermeable layer.


The Hause affidavit explains that the Rancouille coating does not and cannot form a gas impermeable layer. As such, Rancouille does not teach all elements of the present invention, and lacks at least an insulating coating comprising microspheres on the inner surface of a pouring shroud that vitrifies on contact with molten metal to form a gas impermeable layer. Claims 10-17 and 19-20 are allowable over Rancouille.

B. Claim 21 is rejected as obvious over Rancouille in light of US 6,283,341 to Muroi, and US 6,380,114 to Brandy. For the reasons stated *supra*, claim 21 is allowable over the cited art. None of the references teaches a method of forming a gas-impermeable layer. Claim 21 is allowable.

Applicants submit pending claims 10-17 and 19-21 are allowable and the application is in condition for allowance. Early and favorable action is earnestly solicited.

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Respectfully submitted,



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